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DEPARTMENT OF TRANSPORTATION

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DOCKET SECTION

PROJECTIONS FOR:

GREAT LAKES

REGISTERED PILOTAGE SERVICE

★ 1996 NAVIGATION SEASON ★

Summary:

Based on analysis of: 1) polling results; 2) commodity markets; 3) mathematical modeling of foreign vessel traffic; and 4) a mid-year comparison of pilotage hours, requirements for Great Lakes registered pilotage service for 1996 are expected to increase approximately 25% in Pilotage District 1, stay the same in Pilotage District 2, and decrease approximately 25% in Pilotage District 3.

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PURPOSE AND BACKGROUND

The purpose of this study is to project the number of U.S. Great Lakes registered pilots who will be needed for the 1996 navigation season. The navigation season on the Great Lakes lasts approximately from April through December each year.

Great Lakes registered pilots provide pilotage services to vessels engaged in foreign trade on the Great Lakes. The number of pilots is determined based on workhour targets established by regulation.

Projecting the correct number of pilots is important because the number of pilots cannot be rapidly changed to meet fluctuating vessel traffic conditions. If there are too few pilots to handle the workload, additional pilots cannot be added quickly. It takes an extended period of time to properly train a registered pilot. If there are too many pilots, pay will decrease and pilots will not meet targeted compensation levels, which negatively affects retention and recruitment of competent pilots.

METHOD

The projections made by this study are based on analysis of four sources: 1) polling results; 2) commodity markets; 3) mathematical modeling of foreign vessel traffic; and 4) a mid-year comparison of pilotage hours. Each of these sources is analyzed separately and then the results are combined to make the final projection for how many pilots will be needed in each Great Lakes Pilotage District in 1996.

DATA AND ANALYSIS

Polling Results

The Saint Lawrence Seaway Development Corporation maintains an International Trade Specialist based in Chicago, IL who keeps in close contact with Port Commissions, Terminal Operators, Steel Producers, Grain Facilities, and many other Great Lakes/Saint Lawrence Seaway users throughout the Great Lakes. These Seaway users are often in the best position to predict vessel traffic on the Great Lakes, since these users are the ones who generate that traffic. In addition to polling information from Seaway users, each Great Lakes Pilot Association was polled to determine what they were projecting for registered pilotage requirements during the 1996 navigation season.

Projections from Seaway users and pilotage groups varied widely. Among Seaway users the high projection was no change (0%), the low projection was a decrease of 50%, and the average projection was for a decrease in foreign vessel traffic of approximately 10-15%.

From the pilot associations, the District 1 pilots predicted an increase of 20%, the District 2 pilots predicted no change and the District 3 pilots predicted an increase of 5-10%.

Commodity Markets

Foreign vessel traffic on the Great Lakes, which Registered pilots serve, is heavily influenced by two commodities - grain and steel. Approximately 90% of the cargoes handled by foreign trade vessels are related to these two commodities. The supply and demand of these commodities has a relatively large effect on foreign trade vessel traffic, and therefore the demand for registered pilotage service.

For 1996, the outlook for grain shipments during most of the navigation season is not promising. At the beginning of the season was a scare involving infection of some wheat stocks with karnal bunt, and the potential that some countries might ban importation of U.S. wheat because of the infection. This scare proved to be short-lived and is not believed to have had much of an effect. More troubling, however, is the state of the U.S. winter wheat crop. Drought in much of the midwest has wiped out a large portion of the winter wheat crop. Many farmers plowed under their fields because the yield was too barren to make harvesting worthwhile. As a result, U.S. stocks of grain are at their lowest point in several decades, and will stay that way at least until the fall harvest. With little grain to ship, demand for foreign trade vessels to carry that grain is likely to be weak at least until the fall, but should rebound after that if the fall harvest is good. Unfortunately, heavy spring rains in the northern sections of the midwest significantly delayed planting. If there is a substantial grain harvest in the fall of 1996, it is likely to come late in the season.

In steel and related products, developments have not been as extreme as they have been with grain. Demand for steel has been good and prices have not changed significantly. Steel imports into Burns Harbor, IL were significantly down at the beginning of the year due to a fire at the Beta Steel facility. However, the facility is now back on line and steel shipments have increased accordingly. On the whole, steel exports and imports are expected to be about the same as last year.

With negative prospects for grain and stable prospects for steel, the effect of commodity changes on the demand for registered pilotage service will be negative. This decrease in foreign vessel traffic is likely to be more pronounced in the western regions of the Great Lakes since grain is generally a larger proportion of the cargoes in the western Great Lakes than it is in the eastern Great Lakes. The eastern Great Lakes may even experience an increase in vessel traffic as vessels delivering inbound cargo make their deliveries to Lake Ontario ports instead of traveling all the way to Duluth and returning in ballast.

Mathematical Modeling

Since registered pilotage service is tied to foreign trade vessels on the Great Lakes, a mathematical model was developed to predict foreign vessel traffic entering the Great Lakes. The data consists

of records from 1959 to present of foreign vessel transits for the Montreal-Lake Ontario section of the Great Lakes. The source of the data is the U.S. Saint Lawrence Seaway Development Corporation and the Canadian Saint Lawrence Seaway Authority.

A statistical, model-building software package was used to analyze the data and test various models for goodness of fit. Many models were tested including simple linear regression models, non-linear models, exponentially smoothed models, models with constants, models without constants, and models with various lag and weighting factors. The mathematical model with the best fit (i.e., which generated the lowest Sum of Square Errors) was an ARIMA (3,0,2) model. ARIMA stands for Auto-Regressive Integrated Moving Average. ARIMA is a time series analysis technique. In brief, ARIMA modeling identifies, estimates and diagnoses trends in a series of data and the random disturbances or shocks that affect the level of the series.

The ARIMA model predicts that foreign vessel traffic on the Great Lakes will increase 5% in 1996.

Mid-Year Comparison of Pilotage Hours

The SLSDC's Office of Great Lakes Pilotage keeps a database of pilotage hours that are performed in each pilotage district each year. A comparison of the pilotage hours performed January-June 1995, with pilotage hours performed January-June 1996, shows that pilotage hours have increased 34.96% in Pilotage District 1, decreased 4.5% in Pilotage District 2, and decreased 42.86% in Pilotage District 3.

FINAL PROJECTION FOR 1996

Projections for 1996 vary widely between sources. Polling data predicts vessel traffic and pilotage hours will decrease approximately 10-15% in 1996. Commodity markets indicate that shipments of steel will be approximately the same while shipments of grain are likely to decrease. Mathematical modeling predicts an increase in foreign vessel traffic of approximately 5%. Finally, a mid-year comparison of pilotage hours in 1996 versus pilotage hours in 1995 indicates that pilotage hours performed in 1996 have increased approximately 35% in Pilotage District 1, decreased approximately 5% in Pilotage District 2, and decreased approximately 43% in Pilotage District 3.

Aggregating all four sources of data, it appears that the overall level of foreign vessel traffic and pilotage hours in 1996 will be approximately the same as in 1995. However, while overall levels may be similar, it is clear that there will be wide differences between the districts. The most current data on pilotage hours shows there is a pronounced decrease in pilotage hours in District 3, a pronounced increase in pilotage hours in District 1, and very little change in District 2.

The most likely cause of the disparity in pilotage hours between districts is the decrease in grain shipments. It is expected that grain shipments will increase significantly in the latter part of the year because farmers and grain dealers will want to take advantage of high grain prices and sell their crops as quickly as possible. If so, this should mitigate the disparity in vessel traffic between the three districts.

If grain shipments increase as expected, it is estimated that pilotage hours in District 1 will increase 25%, District 2 will stay the same, and pilotage hours in District 3 will decrease 25%.